Appendix 1

STATEMENT OF WORK FOR THE ENOCH VALLEY, HENRY, AND BALLARD MINES REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

INTRODUCTION

This statement of work (SOW) provides an overview of Work that will be carried out by P4 Production, L.L.C. (Respondent) as it implements the Remedial Investigation and Feasibility Study (RI/FS) at the Enoch Valley, Henry, and Ballard Phosphate Mine Sites in southeastern Idaho (collectively the "Sites"). This RI/FS SOW is attached, and is incorporated by reference as Appendix 1 to the Administrative Settlement Agreement and Order on Consent/Consent Order for Remedial Investigation/Feasibility Study ("Settlement Agreement") for the Sites. The technical work described in this SOW is intended to provide more information and direction to the Respondent for the purpose of implementing the Settlement Agreement and is not intended to change the meaning of any Settlement Agreement language. This SOW is also consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP 2003). Any discrepancies between the Settlement Agreement and the SOW are unintended. The Settlement Agreement will control any interpretive disputes.

Purpose

The Settlement Agreement provides for the performance by P4 of an RI and FS for each of the Sites. The objectives of the Parties are: (a) to determine the nature and extent of contamination and any threat to the public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants or contaminants at or from the Sites, by conducting a remedial investigation; and (b) to determine and evaluate alternatives for remedial action, if any, to prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants, or contaminants at or from the Sites, by conducting a feasibility study. The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI will support the development of remedial alternatives in the FS.

Oversight

All work products submitted to EPA are subject to EPA approval, including but not limited to, submissions specified in the Work Plan(s) or Settlement Agreement and additional work products that may be required under Work Plan modifications. Respondent shall ensure that all plans, reports, and records are comprehensive, accurate, and consistent in content and format with the NCP and relevant EPA guidance.

The Respondent shall prepare and submit Quarterly Progress Reports to EPA to aid in project planning. These reports will document the status of all work products under development. These reports shall describe the actions and decisions taken, and problems encountered during the previous quarter, and activities scheduled during the upcoming reporting period. Progress reports shall also summarize the extent to which the procedures and dates set forth in the

Settlement Agreement and the Work Plan are being met. These reports shall be submitted according to the schedule in Attachment A.

Schedule

Refer to Attachment A for the primary and potential secondary deliverables and associated schedules.

Guidance

The Respondent shall conduct the RI/FS and produce reports that are in accordance with the Settlement Agreement and this SOW; the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (RI/FS Guidance) (U.S. EPA, Office of Emergency and Remedial Response, October 1988); and any other guidance that EPA uses in conducting an RI/FS, as well as any additional requirements in the Settlement Agreement and this SOW. The RI/FS Guidance describes the report format and the required report content.

Remedy Requirements

The remedial action alternative selected by EPA (in conjuction with the Forest Service at the Enoch Valley Mine, and DOI at the Henry Mine) will meet the cleanup standards specified in Section 121 of CERCLA. That is: the selected remedial action will be protective of human health and the environment; will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements (ARARs) of other laws; will be cost-effective; will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and will address the statutory preference for treatment of the principal threats. The final RI/FS and risk assessment reports, as adopted by EPA, will, with the administrative record, form the basis for the selection of the Site's remedy and will provide the information necessary to support the development of the Record of Decision (ROD).

TASK 1 - SCOPING

Scoping is the initial planning process of the RI/FS. When scoping the specific aspects of this project, the Respondent shall meet with EPA and the Support Agencies to discuss all project planning decisions and special concerns associated with the Site. During the scoping process, the site-specific objectives of the RI/FS, including the preliminary remediation goals (PRGs), will be proposed by the Respondent and approved by EPA. The site-specific objectives of the RI/FS will be used to help evaluate the adequacy of the existing information and to identify any data gaps. The Respondent shall develop and document the specific project scope as discussed during the scoping meeting in a RI/FS Work Plan. Substantial work has already been conducted and the work required to complete an RI/FS is not fully known. Because the work is phased in accordance with a site's complexity, it may be necessary to modify the Work Plan during the RI/FS to satisfy the objectives of the study.

The following activities shall be performed by the Respondent as a function of the project planning process.

a. Present Site Background and Status Information

The Respondent shall gather, analyze, and present the existing background information on the

Sites and shall participate in a work session with EPA and the Support Agencies to assist in planning the scope of the RI/FS. The Respondent will evaluate the existing information relative to the specific requirements of the RI/FS process.

Collect and analyze existing data and document the need for additional data

All existing site data shall be thoroughly compiled and reviewed by the Respondent. Specifically, this must include presently available data relating to the varieties and quantities of hazardous substances (or source areas from which hazardous materials are released) at the Sites, and past disposal practices. This must include a summary of results from sampling events conducted under the 2003 AOC, and a summary of data collection activities that are in progress under the 2003 AOC. Only those data that are determined by EPA to be of appropriate type and quality to support specific intended uses may be utilized in the RI/FS and risk assessments.

This task also includes compilation and review of data from any previous sampling events that may have been conducted in advance of the 2003 AOC/CO that the Respondent intends to use in the RI/FS. The historic information collected prior to the 2003 AOC/CO will be evaluated for quality and usability, consistent with EPA guidance. Again, only those data that are determined by EPA to be of appropriate type and quality to support specific intended uses may be utilized in the RI/FS and risk assessments. The Respondent will submit a report documenting the results of the evaluation, which will be subject to Agency approval.

The Respondent will utilize this information to recommend to EPA whether additional data are needed to characterize the Site, to better define potential ARARs, and to develop a range of preliminarily identified remedial alternatives. DQOs shall be updated and refined, subject to EPA approval, which will define the type, quality, and quantity of data needed to support the future cleanup decisions. The updated DQOs may also be used to evaluate the usability of historic data.

b. Project Planning

Once the Respondent has collected and analyzed existing data, the specific project scope must be planned. Project planning activities include those tasks described below, as well as identifying data needs, developing a work plan, designing a data collection program, and identifying health and safety protocols. The Respondent shall meet with EPA and the Support Agencies regarding the following activities before drafting the scoping deliverables listed below.

Update Conceptual Site Model

A conceptual site model (CSM) including known and suspected sources of contamination, types of contamination and affected media, known and potential routes of migration, and known or potential human and environmental receptors has been presented in deliverables prepared pursuant to the 2003 AOC/CO. The CSM for the Sites includes various species and their habitats that could be impacted by Site-related contamination and shows the relationships among species and potential exposure pathways. The CSM also identifies potential human receptor populations and potential human exposure pathways. The existing CSM will be revised and updated based on any new information or findings. This effort, in addition to assisting in

identification of locations where sampling is necessary, will also assist in the identification of potential remedial technologies. Additional information for evaluating exposure concerns through the use of a conceptual model is provided in the DQO guidance.

Refine and document preliminary remedial action objectives and alternatives

Once existing site information has been analyzed and an understanding of the potential Site risks has been established, the Respondent shall prepare preliminary remedial action objectives for each actually or potentially contaminated medium. The preliminary remedial action objectives will be documented in a technical memorandum and subject to Agency approval.

The Respondent shall then identify a preliminary range of broadly defined potential remedial action alternatives and associated technologies. The range of potential alternatives shall encompass, where appropriate, alternatives in which treatment significantly reduces the toxicity, mobility, or volume of the waste; alternatives that involve containment with little or no treatment; and a no-action alternative.

Treatability studies

If potential remedial actions involving treatment have been identified by the Respondent or EPA, Respondent shall conduct treatability studies except where the Respondent can demonstrate to the satisfaction of EPA that they are not needed. Where treatability studies are needed, initial treatability testing activities (such as research and study design) must be documented in technical memoranda and planned to occur concurrently with site characterization activities.

Document preliminary identification of ARARs

The Respondent shall conduct a preliminary identification of potential ARARs (chemical-specific, location-specific, and action-specific). This is to assist in the refinement of remedial action objectives and the initial identification of remedial alternatives and ARARs associated with particular actions. ARAR identification will continue as site conditions, contaminants, and remedial action alternatives are better defined.

c. Scoping Deliverables

The Respondent shall submit a report evaluating quality and usability of existing data, an RI/FS Work Plan, and an updated Site health and safety plan (HASP) in accordance with Attachment A. In addition, if additional data collection activities are planned to support RI/FS activities, the Respondent shall submit Sampling and Analysis Plan(s) (SAPs) consisting of a field sampling plan (FSP) and a quality assurance project plan (QAPP) to support those sampling activities. The RI/FS Work Plan and SAP(s) must be reviewed and approved by EPA prior to the initiation of field activities. The existing HASP will be updated as necessary for planned RI/FS activities.

Report Evaluating Quality and Usability of Existing Data

The Respondent will submit a report documenting the results of the evaluation of the quality and

usability of existing data, which will be subject to EPA approval. The report will provide an assessment of quality and usability of existing data to support specific intended uses consistent with EPA guidance. This report will document findings, and potential limitations or caveats on the data and make recommendations on actions needed (e.g., confirmation sampling, relaxation of acceptance criteria) for data to support intended uses. Because this deliverable will precede submittal of an RI/FS Work Plan, there are some data sets (e.g., biotic data sets) for which intended uses (e.g., refinement of risk) are generally known but have not been specifically defined. For such data sets, quality and usability will be further evaluated as uses are refined to ensure that data of appropriate type and quality are used to support intended uses. Final approval of the data for these intended uses will be part of the final approval of the RI/FS Work Plan.

RI/FS Work Plan

The RI/FS Work Plan (WP) documenting the decisions and evaluations completed during the scoping process shall be submitted to EPA for review and approval. The WP shall be developed in conjunction with the Sampling and Analysis Plans (SAPs) and the Health and Safety Plan (HASP), although each plan may be delivered under separate cover. The WP shall include a comprehensive description of the work to be performed, including the methodologies to be utilized, as well as a corresponding schedule for completion.

In addition, the WP shall include the rationale for performing the required activities. Specifically, the WP must present a statement of the problem(s) and potential problem(s) posed by the Site and the objectives of the RI/FS. Furthermore, the WP must include a Site background summary setting forth the Site description including the geographic location of the Site, and to the extent possible, a description of the Site's physiography, hydrology, hydrogeology, geology, demographics, land and water use, ecological, cultural, and natural resource features; a synopsis of the Site history and a description of previous responses/investigation that have been conducted at the Site by local, state, federal, or private parties; and a summary of the existing data in terms of physical and chemical characteristics of the contaminants identified, and their distribution among the environmental media at the Site.

EPA has determined that it is appropriate to conduct a baseline human health (HHRA) and ecological risk assessment (ERA). Considering this, a key component of the RI/FS WP is a description of the approach and methodology for conducting the HHRA and ERA.

The HHRA must be conducted in accordance with current EPA guidance. The HHRA should evaluate the potential for current and future adverse human health effects that may be caused by contaminant release(s) from the Site if no action is taken. The HHRA should consist of two phases: problem formulation and risk quantification. The problem formulation phase will identify the conditions at and surrounding the Site that can influence human exposure from site-related releases.

The risk quantification phase of the HHRA shall include the four tasks identified below, and should use the information developed during the problem formulation phase of the HHRA:

- Exposure Assessment - Identifies the pathways by which potential human exposures could occur, describes how they are evaluated, and evaluates the magnitude, frequency, and duration of these exposures

- Toxicity Assessment - Summarizes the toxicity of the contaminants of potential concern and the relationship between magnitude of exposure and the occurrence of adverse health effects
- Risk Characterization - Integrates information from the exposure and toxicity assessments to characterize the risks to human health from potential exposure to chemicals in environmental media
- Uncertainty Analysis - Summarizes the basic assumptions used in the HHRA, as well as limitations of data and methodology

Under EPA guidance, a baseline ERA shall include the following three interrelated phases:

- Problem formulation phase - the process shall begin with the problem formulation because this element defines the objectives and scope of the ecological assessment. Problem formulation identifies ecological resources and attributes at the Site as well as the stressors that could affect these attributes. Two outputs of problem formulation include (1) the conceptual exposure model (CEM) to identify the pathways by which exposure to chemicals of potential ecological concern (COPECs) can occur for ecological receptors, and (2) identification of ecological endpoints that provide measures of the health of ecosystems at the site.
- Analysis phase - the analysis phase shall be directed by the results of the problem formulation. This phase will estimate the magnitude of actual or potential ecological exposures to representative wildlife species ("characterization of ecological exposure") and identifies the types of ecological effects that can result from exposure to site-related chemicals ("characterization of ecological effects"). The outputs of the analysis phase are a profile of potential exposure at the Site and a profile of the toxicological properties of Site-related chemicals (stressor-response profile). These products provide the basis of the risk characterization
- Ecological risk characterization phase - this final phase of the ERA shall integrates the ecological exposure and effects assessments to estimate the potential for adverse impacts to ecological receptors from exposure to site COPECs. This phase shall include a discussion of the lines of evidence and the assumptions and limitations of the analyses.

The WP plan must document the guidance, data evaluation approach (representativeness, grouping, and processing), exposure quantification methods and assumptions, sources of toxicity factors to be used in the ERA and HHRA.

The WP and various SAPs should describe the details of the site investigation, data quality objectives, as well as the data analysis methods to be used to define or quantify risks at the site. If prepared properly, most of the technical details and professional judgement needed to complete the baseline HHRA and ERA will have already been incorporated into the WP and SAPs. The WP and SAPs, after they are implemented, should provide the site manager with the information needed to incorporate risk management decisions into the site remedy selection process.

In addition, the WP shall include a preliminary identification of remedial alternatives and data needs for evaluation of remedial alternatives. The WP must reflect coordination with treatability study requirements, if treatability studies are initiated. Some of this information was presented in

the SI/EECA Work Plans and must be updated and refined in the RI/FS WP. The WP must include a process for and manner of identifying ARARs and the results of the preliminary identification of ARARs.

An integral part of the WP is a detailed description of the tasks to be performed, information needed for each task, information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted EPA. The WP must also include a schedule for each of the required activities; a project management plan, including a data management plan (e.g., requirements for project management systems and software, minimum data requirements, data format and backup data management); and appropriate reporting of progress to EPA and work sessions and presentations to introduce and review key RI/FS work elements. The Respondent must refer to Appendix B of the RI/FS Guidance for a comprehensive description of the contents of the required RI/FS WP.

Because of the iterative nature of the RI/FS, the Respondent may be required to develop additional WPs or modify the initial WP produced pursuant to the Settlement Agreement. When additional data requirements and technical analyses are identified, the Respondent shall submit a technical memorandum documenting the need for additional data, and identify the DQOs whenever such requirements are identified. In any case, the Respondent is responsible for fulfilling additional data collection and technical analysis requirements that may be identified by EPA, consistent with the general scope and objectives of the RI/FS.

Sampling and Analysis Plan(s)

As additional data needs are identified, the Respondent shall prepare a SAP to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet DQOs. The SAP provides a mechanism for planning field activities and consists of a FSP and a QAPP.

The FSP must define in detail the sampling and data-gathering methods that will be used on the project. It must include sampling objectives, sample location and frequency, sampling equipment and procedures, and sample handling and analysis. The QAPP must describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that will be used to achieve the desired DQOs. The DQOs shall, at a minimum, reflect use of analytic methods to identify contamination and remediate contamination consistent with the levels for remedial action objectives identified in the NCP. In addition, the QAPP must address the following: sampling procedures; sample custody; analytical procedures; data reduction, validation, and reporting; and personnel qualifications.

The Respondent shall demonstrate, in advance and to the satisfaction of EPA, that each laboratory it may use is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the chemicals of potential concern (COPCs) in the media of interest within detection and quantification limits consistent with both QA/QC procedures and DQOs approved in the QAPP for the Sites by EPA. The laboratory must have and follow an approved QA program. If a laboratory not in the Contract Laboratory Program (CLP) is selected, methods consistent with CLP methods that would be used at these Sites for the purposes proposed and

QA/QC procedures approved by EPA will be used. The EPA may require that the Respondent submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel qualifications, equipment, and material specifications. The Respondent shall assure that EPA and the Support Agencies have access to laboratory personnel, equipment, and records for sample collection, transportation, and analysis.

The SAP(s), FSP(s), and QAPP(s) shall be prepared in accordance with EPA guidance documents (EPA 2000, 2002a, 2002b, and 2006).

In developing SAPs to address remaining data needs, the Respondent shall review available data, along with ARARs, risk-based screening levels, site-specific risk assessment data needs, treatability study data needs, and feasibility study data needs when developing SAPs.

Site Health and Safety Plan

A HASP shall be prepared in conformance with the Respondent's health and safety program, and in compliance with OSHA regulations and protocols. It should be noted that EPA does not "approve" the Respondent's health and safety plan, but rather EPA reviews it to ensure that all necessary elements are included, and that the plan provides for the protection of human health and the environment.

TASK 2 - COMMUNITY INVOLVEMENT

The development and implementation of community involvement activities are the responsibility of EPA. An Agency Community Involvement Plan was developed to support the 2003 AOC/CO. EPA is updating the existing Community Involvement Plan to support the RI/FS activities. Although implementation of the Community Involvement Plan is the responsibility of EPA, upon EPA's request, the Respondent will assist by providing information regarding the Sites' history, participating in public meetings, and preparing fact sheets for distribution to the general public.

TASK 3 - SITE CHARACTERIZATION

As part of the RI, the Respondent shall perform the activities described in this task, including the preparation of Data Summary Reports (DSRs) and the RI report. The overall objective of RI/FS site characterization is to describe areas of the Site(s) that may pose a threat to human health or the environment. This is accomplished by first determining a site's physiography, geology, and hydrology/hydrogeology, and defining surface and subsurface pathways of migration. The Respondent shall identify the sources of contamination and define the nature, extent, and volume of the sources of contamination, including their physical and chemical constituents as well as their concentrations. The Respondent shall also investigate the extent of migration of this contamination and any changes in its physical or chemical characteristics, as well as characterize background conditions in affected media, to provide for a comprehensive understanding of its nature and extent. Using this information, contaminant fate and transport is then determined and projected.

During this phase of the RI/FS, the Work Plan, SAP, and HASP are implemented. Field data are collected and analyzed to provide the information required to accomplish the objectives of the study. The Respondent shall notify EPA at least 5 working days in advance of the field work regarding the planned dates for the RI/FS field activities. EPA may shorten the 5-day notification requirement as appropriate (for example, in the case of time-critical sampling such as spring high runoff sampling). In such instances, notification of EPA shall occur as soon as practicable in advance of the field activities. The Respondent shall demonstrate that the laboratory and type of laboratory analyses that will be utilized during Site characterization meet the specific QA/QC requirements and the DQOs of the RI. In view of the unknown site conditions, activities are often iterative, and to satisfy the objectives of the RI/FS it may be necessary for the Respondent to supplement the Work specified in the initial WP to address such unknown conditions. In addition to the deliverables below, the Respondent shall provide quarterly progress reports (also deliverables) and participate in work sessions when requested by EPA. During implementation of field activities, the Respondent may be directed to produce weekly progress reports.

a. Field Investigation

The field investigation shall include the gathering of data to define Site physical and biological characteristics, sources of contamination, and the nature and extent of contamination at the Site. Any field investigation activities shall be performed by the Respondent in accordance with the Work Plan and SAP.

The Respondent shall analyze and evaluate the data to describe: (1) site physical and biological characteristics; (2) contaminant source characteristics; (3) nature and extent of contamination; and (4) contaminant fate and transport. Descriptions of the Site physical characteristics, source characteristics, and extent of contamination analyses are utilized in the evaluation of contaminant fate and transport. The evaluation must include the actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants. Where modeling is appropriate, such models shall be identified to EPA in a technical memorandum prior to their use. All data and programming, including any proprietary programs, shall be made available to EPA together with a sensitivity analysis. In accordance with the WP the Respondent shall collect any data required to address data gaps identified by EPA to complete the RI/FS and risk assessment.

In accordance with the WP, the Respondent shall obtain sufficient data, including the potential for contaminant release (for example, long-term leaching from waste and soil materials) and the projection of contaminant fate and transport, for the development and screening of remedial action alternatives, including information to assess treatment technologies.

b. Data Management Procedures

The Respondent shall consistently document the quality and validity of field and laboratory data compiled during the RI.

<u>Document data collection activities</u>

Information gathered during site characterization shall be consistently documented and adequately recorded by the Respondent in well-maintained field logs and laboratory reports. The method(s) of documentation must be specified in the Work Plan and/or the SAP. Field logs must

be utilized to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports must document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and data deficiencies.

Maintain sample management and tracking

The Respondent shall maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only analytical data of appropriate and known quality are reported and utilized in the development and evaluation of remedial alternatives. All sampling and testing data, quality control and quality assurance documentation, and chain of custody forms that are maintained by the Respondent must be in an electronic format easily accessible by EPA and the support agencies. Analytical results developed under the WP must not be included in any site characterization reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, the Respondent shall establish a data security system to safeguard chain-of-custody forms and other project records to prevent loss, damage, or alteration of project documentation.

Data validation management

Respondent will use a 3rd party to validate datasets using the general protocol and process described in the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (NFG; USEPA, 2004), and QA Plans that are consistent with relevant guidance.

All validated data, and the electronic data deliverable (EDD) shall be made available to EPA in electronic format (i.e., computer disc or equivalent). The validated data, along with QA/QC information and data validation summaries, shall be submitted to EPA in electronic format within 120 calendar days from the date of collection of the last sample from each sampling event.

c. Site Characterization Deliverables

The Respondent shall prepare Data Summary Reports following each annual field season and prepare the RI report at the completion of the remedial investigation.

Data Summary Reports

After completing each annual field season's sampling and analysis (i.e., at the end of the field season each calendar year), the Respondent shall prepare a concise Site characterization Data Summary Report (DSR). This report must review the investigative activities that have taken place. The report shall describe and display the location, dimensions, physical condition and varying concentrations of each contaminant for each source and the known extent of contaminant migration through each of the affected media. Location and characteristics of surface and subsurface features should also be included. Each DSR must also evaluate data gaps and identify additional and/or modified sampling and analysis that shall be included in modifications to the SAP for each subsequent field season. If acceptable to EPA, the DSR following the final field season of data collection can be eliminated as a separate deliverable, and the information collected during the final field season can be presented in the RI report.

Remedial Investigation (RI) Report(s)

The Respondent shall prepare and submit a draft RI Report for each of the Sites. These reports shall summarize results of field activities to characterize the Site, sources of contamination, nature and extent of contamination, and the fate and transport of contaminants. The Respondent shall refer to the RI/FS Guidance for an outline of the report format and contents. Following comment by EPA and the Support Agencies, the Respondent shall prepare a final RI Report which satisfactorily addresses the Agencies' comments and incorporates the Agencies' modifications.

Baseline Risk Assessment (BRA) Report(s)

The Respondent shall conduct a Baseline Risk Assessment comprised of a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA) to assess the potential human health and ecological risks posed by the Site in the absence of any remedial action. The Respondent shall conduct the HHRA and ERA consistent with approved RI/FS Work Plan and relevant EPA guidance, using exposure point concentrations developed from data collected at the Site.

The HHRA must include the following components:

- Identification of chemicals of potential concern that are considered to be most important to the human health evaluation.
- Exposure assessment to identify the pathways by which potential human exposure could occur and estimate the magnitude, frequency, duration of the exposure and the related uncertainties for contaminant toxicity (e.g., weight of evidence for a chemical's carcinogenicity).
- Toxicity assessment to summarize the toxicity of the selected chemicals and the relationship between magnitude of exposure and adverse human health effects.
- Risk characterization to integrate the toxicity and exposure assessments to estimate the potential risks to human health from exposure to chemicals in environmental media.

The HHRA shall be consistent with EPA human health risk assessment guidance (EPA, 1989, 1991, 1992, 2004, and 2005).

The ERA shall be conducted using EPA's eight step process. The ERA will evaluate the likelihood of adverse ecological effects occurring as a result of exposure to physical or chemical stressors. The ERA shall contain detailed information regarding the contact or co-occurrence of stressors to the biological community at the Site. Exposure profiles shall be developed to identify ecological habitats and pathways of exposure. The sources and distribution of stressors in the environment shall also be characterized. The ERA shall be conducted in accordance with EPA ecological risk assessment guidance (EPA 1997a, 1997b, and 1998).

The Respondent shall prepare and submit a draft BRA Report for each Site to EPA for review and approval. This report shall summarize results of the site-specific Human Health and Ecological Risk Assessments. Following review by EPA and the Support Agencies, the Respondent shall prepare a final RA Report for each Site which satisfactorily addresses EPA and the Support Agencies' comments and modifications. At the discretion of the EPA, the RA Report may be incorporated into the RI Report.

TASK 4 - TREATABILITY STUDIES

If candidate treatment technologies have not been sufficiently demonstrated, or cannot be adequately evaluated for this Site on the basis of available information, treatability testing must be conducted. Treatability testing shall be performed by the Respondent, if determined necessary by EPA, to assist in the detailed analysis of alternatives. A separate HASP for the treatability studies may be necessary. In addition, if applicable, testing results and operating conditions shall be used in the detailed design of the selected remedial technology. The following activities shall support any treatability studies.

a. Determination of Candidate Technologies in Need of Testing

The Respondent shall propose in a technical memorandum, subject to EPA's review, comment, modification, and approval, candidate technologies for a treatability studies program during project planning (Task 1). The listing of candidate technologies must cover the range of technologies required for alternatives analysis (Task 5.a.) The specific data requirements for the testing program will be determined and refined during site characterization and the development and screening of remedial alternatives (Tasks 3 and 5, respectively).

Once a decision has been made to perform treatability studies, the Respondent shall propose, subject to EPA's review and approval, the type of treatability testing to use (e.g., bench versus pilot). Because of the time required to design, fabricate, and install pilot-scale equipment as well as perform testing for various operating conditions, the decision to perform pilot testing should be made as early in the process as possible to minimize potential delays of the FS. To assure that a treatability testing program is completed on time, and with accurate results, the Respondent shall either submit to EPA a treatability testing Work Plan or an amendment to the original Sites' Work Plan EPA's review and approval.

b. Treatability Deliverables

The deliverables that are required, in addition to the memorandum identifying candidate technologies, if treatability testing is conducted, include a Work Plan, a SAP, and a final treatability evaluation report. EPA may also require a treatability study HASP, where appropriate.

Treatability testing work plan

The Respondent shall prepare a treatability testing Work Plan or amendment to the original Site Work Plan for EPA's review and approval., describing the Site background, remedial technology(ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for treatability testing must be documented as well. Upon the approval by EPA, the Respondent may acknowledge and incorporate the results of relevant treatability studies that the Respondent has ~~they have~~ implemented, and relevant treatability studies other entities may have performed, as appropriate. If pilot scale treatability testing is to be performed, the pilot scale Work Plan will describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating

conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed HASP. If testing is to be performed off-site, permitting requirements must be addressed.

Treatability study SAP

If the original QAPP or FSP is not adequate for defining the activities to be performed during the treatability tests, a separate treatability study SAP or amendment to the original site SAP must be prepared by the Respondent for EPA's review and approval. Task 1, Item c. of this statement of work provides additional information on the requirements of the SAP.

Treatability study HASP

If the original HASP is not adequate for defining the activities to be performed during the treatment tests, a separate or amended HASP must be developed by the Respondent. Task 1, Item c, of this statement of work provides additional information on the requirements of the HASP. EPA does not "approve" the treatability study HASP.

Treatability study evaluation report

Following completion of treatability testing, the Respondent shall analyze and interpret the testing results in a technical report to EPA. Depending on the sequence of activities, this report may be a part of the RI or FS report or a separate deliverable. The report must evaluate each technology's effectiveness, implementability, cost, and actual results as compared with predicted results. The report must also evaluate full scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

TASK 5 – FEASIBILITY STUDY

The Feasibility Study is comprised of two primary activities: (1) the development and screening of alternatives, and (2) the detailed analysis of alternatives. The alternatives surviving the screening process will be subject to the detailed analysis process. The FS Report will document the results of these two components of FS. The Respondent shall develop site-specific FS reports for each of the Sites. Interim deliverables associated with these activities will be identified in the RI/FS Work Plan.

a. Development and Screening of Remedial Alternatives

The development and screening of remedial alternatives is performed to develop an appropriate range of waste management options that will be evaluated. This range of alternatives must include, as appropriate, options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. The following activities shall be performed by the Respondent as a function of the development and screening of remedial alternatives.

The Respondent shall begin to develop and evaluate a range of appropriate waste management options that, at a minimum, ensure protection of human health and the environment and comply with ARARs. This shall be done concurrent with the RI site characterization task. The

following activities shall be performed by the Respondent as a function of the development and screening of remedial alternatives.

Refine and document remedial action objectives

Based on the risk assessment**,** the Respondent shall review and, if necessary, modify the site-specific remedial action objectives, specifically the preliminary remediation goals (PRGs) that were approved by EPA during the scoping phase of the RI/FS Work Plan. The revised PRGs will be documented in a technical memorandum subject to EPA approval. These modified PRGs must specify the contaminants and media of interest, exposure pathways and receptors, and an acceptable contaminant level or range of levels (at particular locations for each exposure route). Objectives and action levels from the AWRMP may be used in the review and modification of the PRGs, considering the site-specific conditions at the Site, as determined appropriate by EPA.

Develop general response actions

The Respondent shall develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

Identify areas or volumes of media

The Respondent shall identify areas or volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the remedial action objectives. The chemical and physical characterization of the Site must also be taken into account.

Identify, screen, and document remedial technologies

The Respondent shall identify and evaluate technologies applicable to each general response action to eliminate those that cannot be implemented at the Site. General response actions must be refined to specify remedial technology types. Technology process options for each of the technology types shall be identified either concurrent with the identification of technology types, or following the screening of the considered technology types. Process options must be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The technology types and process options must be summarized for inclusion in a technical memorandum. The reasons for eliminating alternatives must be specified.

Assemble and document alternatives

The Respondent shall assemble selected representative technologies into alternatives for each affected medium or operable unit in a Site-specific FS. Together, all of the alternatives will represent a range of treatment and containment combinations that will address either the Site or the operable unit as a whole. A summary of the assembled alternatives and their related action-specific ARARs must be prepared for EPA by the Respondent for inclusion in a technical memorandum. The reasons for eliminating alternatives during the preliminary screening process must be specified.

Refine alternatives

The Respondent shall refine the remedial alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. Sufficient information must be collected for an adequate comparison of alternatives. PRGs for each chemical in each medium must also be modified as necessary to incorporate any new risk assessment information presented in the RA Report. Additionally, action-specific ARARs must be updated as the remedial alternatives are refined.

Conduct and document screening evaluation of each alternative

The Respondent may perform a final screening process based on short- and long-term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives shall be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis. As appropriate, the screening must preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives must include options that use treatment technologies and permanent solutions to the maximum extent practicable. The Respondent shall prepare a technical memorandum summarizing the results and reasoning employed in screening, displaying alternatives that remain after screening, and identifying the action-specific ARARs for the alternatives that remain after screening.

b. Detailed Analysis of Remedial Alternatives

The detailed analysis shall be conducted by the Respondent to provide EPA with the information needed to allow for the selection of a Site remedy. This analysis is the final task to be performed by the Respondent during the FS.

The Respondent shall conduct a detailed analysis of alternatives which must consist of an analysis of each option against a set of nine evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

The Respondent shall apply nine evaluation criteria set forth in the NCP to the assembled remedial alternatives to ensure that the selected remedial alternative will be protective of human health and the environment; will be in compliance with, or include a waiver of, ARARs; will be cost-effective; will utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and will address the statutory preference for treatment as a principal element. The evaluation criteria include: (1) overall protection of human health and the environment; (2) compliance with ARARs; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume; (5) short-term effectiveness; (6) implementability; (7) costs; (8) state (or support agency) acceptance; and (9) community acceptance. (Note: Criteria 1 and 2 are threshold criteria that must be met (unless a specific ARAR is waived); Criteria 3-7 are primary balancing criteria; and Criteria 8 and 9 are modifying criteria evaluated by EPA after receiving public comments following release of the RI/FS report and a proposed remedial action plan to the general public.) For each alternative, the Respondent must provide: (1) a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative;

and (2) a discussion of the individual criterion assessment. Since the Respondent does not have direct input on Criteria 8 (state or support agency acceptance), and 9 (community acceptance), these will be addressed by EPA.

The Respondent shall perform a comparative analysis between the remedial alternatives. That is, each alternative must be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are reserved by EPA, and the Forest Service and DOI at the Enoch Valley Mine and Henry Mine respectively. The Respondent shall prepare a technical memorandum summarizing the results of the comparative analysis.

c. Feasibility Study Report

The Respondent shall prepare a draft FS report for each of the Sites for EPA's review and comment. This report, as ultimately adopted or modified by EPA, provides a basis for remedy selection by EPA, the Forest Service, and DOI and documents the development and analysis of remedial alternatives. The Respondent shall refer to the RI/FS Guidance for an outline of the report format and the required report content. The Respondent shall prepare a final FS report for each of the Sites which satisfactorily addresses EPA and Support Agency comments.

REFERENCES

EPA 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA,* U.S. EPA, Office of Emergency and Remedial Response, Interim Final, October, 1988.

EPA 1989. *Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual. Interim Final,* USEPA, December 1989.

EPA 1991. *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors,* USEPA, 1991.

EPA 1992. *Supplemental Guidance to RAGS: Calculating the Concentration Term.* USEPA Office of Solid Waste and Emergency Response, publication 9285.7-081, 1992.

EPA 1997a. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*. EPA 540-R-97-006, 1997.

EPA 1997b. *EPA Region 10 Supplemental Ecological Risk Assessment Guidance for Superfund*. EPA 910-R-97-005, 1997.

EPA 1998. *Guidelines for Ecological Risk Assessment*. EPA/630/R-95/002F, 1998.

EPA 2000. *Guidance for the Data Quality Objectives Process* (EPA QA/G4), 2000.

EPA 2002a. *Guidance for Choosing a Sampling Design for Environmental Data Collection* (EPA QA/G-5S). EPA/240/R-02/005, 2002.

EPA 2002b. *Guidance on Quality Assurance Project Plans* (EPA QA/G-5). EPA/240/R-02/009,

2002.

EPA 2004. *Risk Assessment Guidance for Superfund–Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), Final.* EPA/540/R/99/005, 2004.

EPA 2005. *Guidelines for Carcinogen Risk Assessment. EPA/630/P-03/001F,* 2005.

EPA 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4). EPA/240/B-06/001, February 2006.

IDEQ 2004. *Area Wide Risk Management Plan: Removal Action Goals and Objectives, and Action Levels for Addressing Releases and Impacts from Historic Phosphate Mining Operations in Southeast Idaho*, February 2004, IDEQ# WST.RMIN.SEAW.6005.67068.

MOU 2000. *Memorandum of Understanding between USDA-Forest Service Region 4, Environmental Protection Agency Region 10, USDOI (Bureau of Land Management, Bureau of Indian Affairs and Fish and Wildlife Service), the Shoshone-Bannock Tribes and State of Idaho Division of Environmental Quality concerning Contamination from Phosphate Mining Operations in Southeastern Idaho.* July, 2000.

NCP 2003. *The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR, Part 300*, July 1, 2003.

TetraTech 2002. *Final Area Wide Human Health and Ecological Risk Assessment, Selenium Project, Southeast Idaho Phosphate Mining Resource Area*. Prepared for Idaho Department of Environmental Quality by TetraTech EM, Inc., December, 2002.

Statement of Work Attachments:

Attachment A – Schedule

Attachment A

RI/FS SOW Schedule for Primary Deliverables (all days are calendar days.) *Note: This schedule lists only major deliverables. Other deliverables including interim reports, plans, and technical memoranda are not specifically listed here. The Work Plan shall provide target dates for these secondary deliverables.*

RI/FS Work Plan and Sampling and Analysis Plans (WP and SAPs):

- Within 45 days of the Effective Date of the Settlement Agreement, Respondent submits a draft report evaluating quality and usability of existing data and Data Approval Request seeking approval of potentially relevant data collected prior to or under the 2003 CO/AOC
- Within 21 days of receipt, Agencies will provide comments on draft report and Data Approval Request
- Meet with Agencies within 14 days after receipt of comments (or as soon thereafter as is practicable if necessary to accommodate Agencies' schedules)
- Within 21 days of receipt of comments on draft report, Respondent submits a final report evaluating quality and usability of existing data and data approval request
- Within 21 days after receipt of final report, Agencies will provide written confirmation as to approval or rejection of data, findings, and recommendations in the Data Approval Request (deadline included for planning purposes only)
- Within 60 days of receipt of Agencies' formal response to the Data Approval Request, Respondent submits a draft Data Gap Analysis and Draft RI/FS Work Plan
- Within 45 days of receipt, Agencies will provide comments on the draft Data Gap Analysis and Draft RI/FS Work Plan (deadline included for planning purposes only)
- Within 21 days of receipt, meet with Agencies to discuss comments on the draft Data Gap Analysis and Draft RI/FS Work Plan (or as soon thereafter as is practicable if necessary to accommodate Agencies' schedules)
- Within 30 days of the meeting with the Agencies, Respondent submits a final Data Gap Analysis and final RI/FS Work Plan
- Scoping meetings to be held at Respondent's request during development of planning deliverables

Note: Much of the information needed to complete an RI has been collected and additional data collection planning is on-going under the 2003 CO/AOC. It is envisioned that these on-going data collection activities will proceed as planned and not be delayed pending approval of the RI/FS Work Plan. If additional data needs are identified during development of the WP, then SAPs will be developed consistent with the schedule outlined above.

Data Validation Summaries (DVSs):

- DVSs due within 90 days from the date of collection of the last sample from each

sampling event.

Data Summary Reports (DSRs):

- Draft DSRs due within 120 days completion of each season's field work or within 90 days of the receipt of final laboratory data, whichever is earlier .
- 30 days for Agencies to submit comments (for planning purposes).
- 21 days for Respondents to submit responses to Agencies' comments.
- Within 21 days a meeting/conference call will be held to discuss outstanding issued identified in responses to comments.
- Within 30 days of the above meeting/conference call submit Final DSRs.

Remedial Investigation (RI) Report(s):

- Submit draft RI report for Ballard Mine Site within 120 days after receipt of validated laboratory data from the final field season.
- Submit draft RI report for Henry Mine Site within 30 days following approval of Ballard Mine Site RI report
- Submit draft RI report for Enoch Valley Mine Site within 30 days following approval of Henry Mine Site RI report.
- 45 days for Agencies to submit comments (for planning purposes).
- 21 days for Respondents to submit response to Agencies' comments.
- Within 21 days a meeting/conference call will be held to discuss outstanding issues identified in responses to comments
- Within 30 days of above meeting/conference submit mine-specific Final RI.

Baseline Risk Assessment (BRA) Report(s):

- Submit mine-specific draft BRA within 60 days after submittal of draft RI.
- 45 days for Agencies to submit comments (for planning purposes).
- 21 days for Respondents to submit responses to Agencies' comments.
- Within 21 days a meeting/Conference call will be held to discuss responses.
- Within 30 days of above meeting/conference submit mine-specific Final BRA.

Feasibility Study (FS) Report(s):

- Submit draft FS within 120 days after submittal of mine-specific Final BRA Report.
- 45 days for Agencies to submit comments (for planning purposes).

- 21 days for Respondents to submit responses to Agencies' comments.
- Within 21 days a meeting/conference call will be held to discuss outstanding issued identified in responses to comments.
- Within 30 days of the above meeting/conference submit mine-specific Final FS Report.

Quarterly Progress Reports:

- January 15
- April 15
- July 15
- October 15

Interim Deliverables

- Draft Interim Deliverables, as identified in the SOW, shall be due as required in the SOW. Other interim deliverables, not specifically listed in the SOW but as identified and required by the Agencies, shall be due within 30 days receipt of notice by Respondent that said Deliverable is required.
- Final Interim Deliverables due within 30 days of receipt of consolidated Agency comments.